The Universe as a Spherical Living Membrane: A Speculative Cosmological Framework

Abstract

This paper presents a speculative cosmological model wherein the universe is conceptualized as a spherical living membrane. Instead of a passive, inert space-time continuum, this framework envisions the cosmos as an actively self-regulating, conscious system whose boundary encodes and manages all interior phenomena. This approach reframes persistent cosmological mysteries—dark matter, dark energy, and the cosmological constant problem—as signatures of both inter-universal interaction and the universe's own survival mechanisms.

1. Introduction

The conventional Lambda-CDM model describes the universe as a 3D expanding spacetime containing matter, dark matter, and dark energy. However, observational anomalies (large-scale structures exceeding expected sizes, non-detection of dark matter particles, and the cosmological constant discrepancy) suggest our current framework may be incomplete. This model draws on three inspirations: the holographic principle, panpsychism, and biological analogy. From this synthesis emerges the hypothesis of the universe as a spherical living membrane.

2. The Spherical Living Membrane Model

In this model, the universe is an infinitesimally thin spherical shell. All information, physical laws, and energy states are encoded on this boundary. The 3D interior we inhabit is a holographic projection of the boundary's information state. This boundary is not inert; it is a dynamic, self-organizing membrane akin to a cellular wall or neural sheath. Consciousness is distributed across the membrane, cosmic filaments function like neurons, and feedback mechanisms regulate expansion and internal processes.

3. Dark Matter and Dark Energy in the Membrane Framework

Dark matter is interpreted as fragmented remnants of the universe's original magnetic field – magnetic shrapnel. Dark energy represents the immune response of the living universe: accelerated expansion to isolate compromised regions and regenerate stability.

4. Cosmological Constant Problem as Evidence

The enormous discrepancy between quantum field theory's predicted vacuum energy and the observed dark energy density is interpreted as the total energy siphoned away. The residue we observe today is the operational baseline of the universe after extensive extraction.

5. Implications for Observations

If this model is valid, we should expect correlations between dark matter distributions and magnetic field disruptions, large-scale alignments reflecting the boundary's topology, systematic absence of white holes, and subtle variations in dark energy density consistent with active regulation.

6. Biological Analogy

The living membrane can be mapped to biological systems. The following table compares features:

Biological Feature (Cell)	Cosmic Feature (Membrane)	Function
Cell wall	Spherical boundary	Encodes, protects, regulates interior
Cytoskeleton / nerves	Cosmic filaments & magnetic fields	Transmit energy/information
Pores/Channels	Black holes / White holes	Intake/excretion of energy/matter
Immune response	Dark energy (accelerated expansion)	Defense/healing
Scars	Dark matter (magnetic shrapnel)	Remnants of damage

7. Testable Hypotheses

This model suggests observational tests: mapping cosmic magnetic fields against dark matter, identifying gravitational anomalies inconsistent with particle dark matter, and searching for cyclic variations in dark energy density.

8. Conclusion

Viewing the universe as a spherical living membrane unifies several puzzles under one framework. This model reframes the cosmos as a conscious, self-regulating organism, possibly compromised by external extraction, now fighting to heal itself. It challenges the view of a mechanical universe, proposing instead a living cosmic system.